

Supplemental Monitoring Report

Grazing Capacity Analysis

Apache-Sitgreaves National Forests

July 2000

Purpose and Need. This monitoring report is designed to meet the intent of Supplement Number Two Section 1 Clause G of the Master Memorandum of Understanding between the Arizona Game and Fish Commission and the USDA Forest Service. The Apache-Sitgreaves National Forests agreed to reevaluate forest plan AUM capacity and adjust the forest plan accordingly. This report fulfills that memorandum of understanding instrument between the two parties.

Introduction. This grazing capacity analysis report has brought together all available information that pertains to grazing capacity for the Apache-Sitgreaves National Forests (see attached Table 1). The report uses analyses that applied the standards and guidelines from the Apache-Sitgreaves National Forests Plan as amended. An interdisciplinary team used current site-specific analysis wherever it was available. Since 1995 to present Forest personnel have developed many new allotment management plans and have adjusted on going grazing to comply with forest plan direction. This report brings the results of those analyses together. Analysts used projections to estimate capacity where site-specific analysis is not available. These projections lack site-specific adjustments or verifications that characterized individual grazing allotment projections of grazing capacity.

Methods. The data for this report were obtained from available sources such as the site specific environmental analyses conducted on dozens of allotments since 1995. Where site-specific analyses were not available projections of capacity using statistical methods and geographic information systems were employed. Experienced professionals and technicians reviewed these projections but lack ground measurements that characterize data collected from site-specific analyses. The site-specific data accounts for 55% of AUM capacity and GIS projections account for 45%.

Scope and Applicability. The projections of forest level grazing capacity should not be used to make site-specific decisions or inferences for lands with out additional information. The estimates of capacity using programmatic scale projections are the best available information for a forest wide projection given the lack of site-specific data. These programmatic estimates for individual allotments would include errors because the model projects average outputs for conditions where little information is available. This introduces error into estimation of individual areas. The analysis

assumes error to be normally distributed. That is to say that the errors are offsetting within the entire group of estimates.

Analytical Findings. The more recently developed project level assessments document the distribution of a small portion of available forage to livestock grazing. These recent site-specific analyses projected total forage production in addition to that available for livestock production. This set of grazing allotments, collectively, allocates 77% of total forage production to ecosystem maintenance. This demonstrates availability of vegetation for watershed protection of soils and streams as well as wildlife needs.

The system used in these estimates typically allows less forage utilization by livestock on areas with very poor or poor range condition. If expected forage utilization levels occur from wild grazing ungulates, the ranges should improve. Increases in plant productivity and species diversity should follow the rest and protection of ranges. The population densities and numbers of wild ungulates are known with less certainty. Their timing of use on ranges is highly variable and is often driven by annual climatic variations.

The identified grazing capacity from this report represents a pronounced change from the original Forest Plan estimate of grazing capacity. The scale of change is attributable to several factors:

- Allowable use levels in the original forest plan were closer to 50% of forage production. This factor was reduced in recent allotment management plans.
- Allowable use by range condition class reduces the amount of forage committed to livestock grazing
- A portion of forage for some allotments is specifically allocated to wild ungulates
- More vegetation is committed to achieve watershed protection.
- Provision for more forage available to wildlife; directly to herbivores and indirectly to predators such as Northern goshawks.
- Production estimates of the original plan included substantial emphasis on timber harvest with grass seeding to increase forage for wildlife and livestock.
- Lack of forage production projects such as pinyon-juniper treatments with grass seeding.
- Continued in growth of forest and woodland canopies suppressing forage species.

Monitoring Findings. Three types of monitoring occur in forest planning. The first type is implementation monitoring which focuses on whether the forest plan is being implemented. The second monitoring is effectiveness monitoring. The focus of this inquiry is whether the implementation is having its desired effect. Finally validation monitoring assesses whether the underlying assumptions of the forest plan are valid. Evaluation of these three monitoring types determines whether Forest Plan goals and objectives are being met. The following paragraphs present conclusions of this supplemental monitoring report.

Implementation Monitoring. The forest plans direction has not been fully funded. This contributed to shortfalls in forage production for livestock and wildlife. The expectations that timber harvest and seeding would further augment available forage have not been met. This is due to changed emphasis that shifted forest management from production of wood fiber to habitat improvement. Forest standards and guidelines have been followed in projects; particularly with respect to range allotment management plans. No other activity has come so close to achieving direction on a prescribed timetable.

Effectiveness Monitoring. Where the grazing adjustments have been implemented, improvements have been observed in many cases. Although the time frames for recovery have been very short, less than 30% of the time thought to be necessary for full recovery, significant improvements have occurred. First improvement most commonly occurs in or near riparian areas. Secondly, recovery is most rapid on sites with higher precipitation and where tree canopy is not limiting forage production. Recovery has not occurred where ungulate grazing produces continued over utilization of grass and grass-like plants.

Validation Monitoring. Validation monitoring has received some emphasis. A study of the West Fork grazing allotment is underway. This study seeks to determine the effects of livestock and wild ungulate herbivory on riparian conditions. The study also seeks to document the possible correlation of the above effects on fish habitat conditions. Although the study has not reached any formal conclusions, it does suggest to date that herbivory can indeed be the limiting factor to recovery of riparian vegetation.

Conclusion: The goals and objectives for livestock management in the forest plan are being met on a time line that is producing sustainable ecological conditions. Improvement should continue as further grazing adjustments are applied to grazing allotments and as time allows the effects of changed systems to be expressed ecologically. The results of implementation, effectiveness, and validation monitoring bear this out. While the grazing capacity is lower than originally projected, it is the outcome of implementing Forest Plan direction.

Table 1. Estimated Forage Production and Available AUMs¹ by Grazing Allotment – Alpine Ranger District

ALPINE RD ALLOTMENTS	TOTAL FORAGE PRODUCTION ²	AVAILABLE FORAGE PRODUCTION FOR		AUMS FROM AVAILABLE LIVESTOCK FORAGE PRODUCTION	RANGE CAPABILITY ⁴ (% OF ALLOTMENT ACRES)		
		LIVESTOCK	WATERSHED, VEGETATION, WILDLIFE & SOILS RESOURCES ³		FULL CAPABILITY	POTENTIAL CAPABILITY	NO CAPABILITY
Alpine		213,000		213	43	15	42
Beaver Creek		650,000		650	92	4	4
Black River		430,650		330	82	18	0
Bobcat-Johnson		319,000		319	26	3	71
Boneyard & Nutrioso Winter	}	255,780		292	96	0	4
Bush Creek		675		1	35	0	64
Colter Creek		322,411	1,716,238	450	91	3	7
Cow Flat & Foote Creek Winter	}	244,833	3,134,649	759	36	28	35
Coyote-Whitmer		676,000		676	11	19	70
Fish Creek & Hannagan	}	278,000		278	59	19	23
Fishhook-Steeple Mesa		411,000		411	51	20	29
Grandfather		131,145	1,758,120	162	75	1	24
KP	594,277	465,000		465	19	16	65
Lower Campbell Blue		122,013	884,837	137	71	29	0
Nutrioso Summer	1,006,850	320,160		368	38	24	38
Raspberry		81,000		81	65	10	25
Red Hill		35,702	1,155,407	104	89	11	0
South Escudilla		196,881		225	3	5	92
Sprucedale-Reno				1,144	14	6	80
Stone Creek,					93	9	9
PS, & Foote Creek Summer	}	619,871	3,029,814	643	91	9	0
Tenney		44,370		51	35	64	1
Turkey Creek		257,000		257	66	32	0
Upper Campbell Blue		688,000		688	36	62	2
West Fork		471,100	1,582,359	523	95	5	0
Williams Valley	2,053,459	395,850		455	21	24	56

Table 1. Estimated Forage Production and Available AUMs¹ by Grazing Allotment – Black Mesa Ranger District

BLACK MESA RD ALLOTMENTS	TOTAL FORAGE PRODUCTION ²	AVAILABLE FORAGE PRODUCTION FOR		AUMS FROM AVAILABLE LIVESTOCK FORAGE PRODUCTION	RANGE CAPABILITY ⁴ (% OF ALLOTMENT ACRES)		
		LIVESTOCK	WATERSHED, VEGETATION, WILDLIFE & SOILS RESOURCES ³		FULL CAPABILITY	POTENTIAL CAPABILITY	NO CAPABILITY
Chevelon Canyon	4,809,201	1,058,335	3,750,866	684	87	9	4
Clear Creek	2,637,423	565,856	2,071,567	444	93	2	5
Limestone	4,957,755	1,112,435	3,845,320	625	90	9	1
Wallace	6,906,730	1,723,755	5,182,975	1,032	95	4	1
Black Canyon	1,943,678	273,600	1,670,078	304	88	11	0
Clay Sprs	4,095,411	963,788	3,131,623	1,071	65	35	0
Heber	17,124,383	3,272,333	13,852,050	3,636	18	79	3
Long Tom	6,364,244	1,037,059	5,327,185	1,152	52	47	1
Park-Day Wash	3,859,050	740,938	3,118,112	823	99	1	0
Pierce Wash	1,363,150	172,356	1,190,794	354	100	0	0
Verde	431,982	89,314	342,668	108	100	0	0
Wildcat	2,907,502	556,200	2,351,302	618	100	0	0
Willow Wash & Sundown	7,672,438	1,473,108	6,199,330	1,488	87 99	9 1	4 0

Table 1. Estimated Forage Production and Available AUMs¹ by Grazing Allotment – Clifton Ranger District

CLIFTON RD ALLOTMENTS	TOTAL FORAGE PRODUCTION ²	AVAILABLE FORAGE PRODUCTION FOR		AUMS FROM AVAILABLE LIVESTOCK FORAGE PRODUCTION	RANGE CAPABILITY ⁴ (% OF ALLOTMENT ACRES)		
		LIVESTOCK	WATERSHED, VEGETATION, WILDLIFE & SOILS RESOURCES ³		FULL CAPABILITY	POTENTIAL CAPABILITY	NO CAPABILITY
AD Bar	3,802,591	79,084	3,723,507	88	3	32	65
Alma Mesa	5,427,848	362,312	5,065,536	403	27	25	48
Baseline-Horsesprings	2,813,014	75,450	2,737,564	3,019	22	45	32
Blackjack	4,982,819	191,378	4,791,441	213	12	25	63
Copperas	1,932,271	153,806	1,778,465	171	20	42	38
Dark Canyon	2,090,900	707,585	1,383,315	915	1	46	53
Double Circle	15,952,375	4,877,736	11,074,639	5,420	23	40	37
East Eagle	8,971,083	2,889,360	6,081,723	3,210	24	23	53
Granville	1,076,075	501,451	574,624	854	4	32	64
Hell's Hole	712,000	253,400	458,600	497	2	16	82
Hickey	9,672,600	2,974,780	6,697,820	3,305	12	48	40
Hog Trail	1,291,391	28,483	1,262,908	32	4	25	71
Lop Ear	616,269	17,775	598,494	20	19	0	81
Mesa	249,878	154,965	94,913	172	37	16	47
Mud Springs	7,830,100	2,551,341	5,278,759	2,835	18	29	53
Pigeon	3,778,798	1,734,487	2,044,311	2,177	6	25	68
Pleasant Valley	4,292,155	570,392	3,721,763	634	16	37	47
Sandrock	7,636,829	0	7,636,829	0	4	26	71
Sardine	1,263,102	10,075	1,253,027	279	0	20	80
Strayhorse	2,418,600	266,890	2,151,710	1,477	21	22	57
Tule	2,636,986	908,403	2,592,391	1,009	1	38	61
Wildbunch	4,084,330	1,420,334	2,663,996	2,535	5	38	58

Table 1. Estimated Forage Production and Available AUMs¹ by Grazing Allotment – Lakeside Ranger District

LAKESIDE RD ALLOTMENTS	TOTAL FORAGE PRODUCTION ²	AVAILABLE FORAGE PRODUCTION FOR		AUMs FROM AVAILABLE LIVESTOCK FORAGE PRODUCTION	RANGE CAPABILITY ⁴ (% OF ALLOTMENT ACRES)		
		LIVESTOCK	WATERSHED, VEGETATION, WILDLIFE & SOILS RESOURCES ³		FULL CAPABILITY	POTENTIAL CAPABILITY	NO CAPABILITY
Arab	621,497	120,410	501,087	135	93	7	0
Blue Ridge	1,058,489	163,170	895,319	181	21	69	10
Brown Creek		285,300		317	96	4	0
Buck Springs & Brushy Mountain	}	136,800		152	99	1	0
Carlisle Complex:							
Capps, Dodson, Juniper Ridge, Linden, & McNeil	} 3,936,974	888,006	3,048,968	987	96	4	0
Cottonwood	1,541,466	1,034,100	507,366	1149	85	15	0
Ellsworth & Show Low	} 896,616	202,237	694,379	224	98	2	0
Johnson	216,850	66,486	150,364	74	97	2	1
Lake Mountain, Doyle Mountain, Mineral, & Porter Springs	} 3,959,636	737,094	3,222,542	720	93	7	0
Ortega	5,164,692	978,431	4,186,261	1,087	100	0	0
Pinedale	2,038,239	508,500	1,529,739	565	100	0	0
Piñon		283,500		315	98	2	0
Sponsellor	2,434,690	580,630	1,854,060	645	52	48	0
Town Tank	43,773	13,500	30,273	24	100	0	0

Table 1. Estimated Forage Production and Available AUMs¹ by Grazing Allotment – Springerville Ranger District

SPRINGERVILLE RD ALLOTMENTS	TOTAL FORAGE PRODUCTION ²	AVAILABLE FORAGE PRODUCTION FOR		AUMS FROM AVAILABLE LIVESTOCK FORAGE PRODUCTION	RANGE CAPABILITY ⁴ (% OF ALLOTMENT ACRES)		
		LIVESTOCK	WATERSHED, VEGETATION, WILDLIFE & SOILS RESOURCES ³		FULL CAPABILITY	POTENTIAL CAPABILITY	NO CAPABILITY
Basin	144,256	35,205	109,051	41	54	0	46
Beehive & Sheep Springs	} 11,033,458	3,790,085	7,243,373	3,747	94	6	0
Benton Creek					89	8	3
Big Lake	242,349	69,047	173,302	82	80	20	0
Burk	813,245	168,078	645,167	187	21	79	0
Burro Creek	2,105,118	717,527	1,387,591	797	94	6	0
Cross Bar	3,820,835	1,002,952	2,817,883	1,114	36	61	3
ELC	4,523,430	1,200,191	3,323,239	1,334	63	34	4
Green's Peak		1,933,470		1,953	83	12	4
Greer	3,335,611	968,100	2,367,511	1,076	89	10	1
Hall	9,948,198	3,226,076	6,722,122	1,852	89	10	1
Harris Lake	3,538,063	958,503	2,579,560	1,065	54	46	0
Hayground		997,200		1,108	98	2	0
Molina Springs	846,434	197,621	648,813	220	14	86	0
Murray Basin	652,342	114,836	537,506	128	91	9	0
North Escudilla	639,764	152,356	487,408	365	69	0	31
Picnic,	2,678,061	619,196	2,058,865	688	86	7	7
Rudd Creek Winter, & Saffel Springs	} 980,904	241,722	739,182	270	58	0	42
Pool Corral					53	29	18
Reservation	3,731,476	1,064,390	2,667,086	1,183	44	19	37
Rudd Knoll	1,610,782	335,918	1,274,864	373	46	52	2
Spur Lake	3,080,028	901,146	2,178,882	1,001	40	60	0
Udall	Administered by the Gila N.F.				65	33	2
Voigt & Rudd Creek Summer	} 5,016,738	696,192	4,320,546	385	99	1	0
Water Canyon & Table Top					89	6	5
	} 1,746,101	318,873	1,427,228	354	61	37	2
					53	7	40
					41	12	47

**Table 1. Total Estimated Forage Production and Available AUMs¹ –
Apache-Sitgreaves National Forests**

A-S NFs	TOTAL FORAGE PRODUCTION ²	AVAILABLE FORAGE PRODUCTION FOR			RANGE CAPABILITY ⁴ (% OF ALLOTMENT ACRES)		
		LIVESTOCK	WATERSHED, VEGETATION, WILDLIFE & SOILS RESOURCES ³	AUMs FROM AVAILABLE LIVESTOCK FORAGE PRODUCTION	FULL CAPABILITY	POTENTIAL CAPABILITY	NO CAPABILITY
Total	260,715,553 ⁵	70,020,30 ⁵	202,041,814 ⁵	78,984 ⁵			

1. AUM = Animal Unit Month which is the amount of feed or forage required by an animal unit for one month. An animal unit is considered to be one mature (1,000 pound) cow or the equivalent based upon average daily forage consumption and trampling of 26 to 30 pounds dry matter per day.
2. Blank cells indicate that total forage production was not calculated during the analysis for the specific allotment(s) listed.
3. Blank cells indicate that available forage production for watershed, vegetation, wildlife and soils resources was not calculated during the analysis for the specific allotment(s) listed.
4. A. Full Capability areas are those that can be used by grazing animals under proper management without long-term damage to the soil resource or plant communities. Typically, these areas have stable soils and vegetative ground cover is maintaining site productivity and producing a minimum of 50 pounds of dried forage per acre per year. Soil loss as judged by available techniques is within tolerance.
B. Potential Capability areas are those that could be used by grazing animals under proper management but where soil stability is impaired, or range developments are not adequate under existing conditions to obtain necessary grazing animal distribution. Generally, these areas have impaired soil stability, lack water, steep terrain, lack of access and/or there is insufficient vegetative ground cover to protect the soil, but if treated, developed, or managed properly could become full capability.
C. No Capability areas are those that cannot be used by animals without long-term damage to the soil resource or plant communities, or are barren or unproductive naturally. These areas are not capable of being grazed by domestic livestock under reasonable management goals. Grazing capacity will not be assigned to these areas, even though light livestock use may occur.
5. Sum of the values presented in the table.